

WHAT IS CLAIMED IS:

1 1. A method of identifying an intervention that mimics the effects of
2 caloric restriction in cells, comprising:
3 obtaining a biological sample;
4 exposing said biological sample to an intervention;
5 waiting a specified period of time;
6 assessing changes in gene expression levels, levels of RNA, protein, or protein
7 activity levels related to one or more biomarkers of aging; and
8 identifying said intervention as one that mimics the effects of caloric
9 restriction if one or more changes in said levels also occurs in caloric restriction.

1 2. The method of claim 1, wherein said biological sample comprises
2 cells.

1 3. The method of Claim 2, wherein said cells are obtained from a
2 mammal.

1 4. The method of claim 3, wherein said mammal is a mouse.

1 5. The method of Claim 1, wherein said change in gene expression levels,
2 levels of RNA, protein, or protein activity levels corresponds to a change in gene expression
3 for a gene encoding a chaperone protein.

1 6. The method of Claim 5, wherein said gene encoding a chaperone
2 protein is GRP78.

1 7. The method of Claim 1, wherein said biomarker is apoptosis.

1 8. The method of Claim 1, wherein said biomarker is aging.

1 9. The method of Claim 8, wherein said biomarker of aging is a
2 production of cancer cells.

1 10. The method of Claim 1, wherein said changes in said gene expression
2 level, levels of RNA, protein, or protein activity levels related to one or more biomarkers of
3 aging occur in 6 weeks or less.

1 22. The method of Claim 24, wherein the reference animal has been on a
2 calorie restricted diet for less than about 2 weeks.

1 23. The method of Claim 19, wherein said test animal is a mouse.

1 24. The method of Claim 19, wherein changes in gene expression are
2 assessed in said test animal.

1 25. The method of claim 19 which further comprises:
2 obtaining a gene expression profile from a calorie restricted reference animal;
3 comparing changes in gene expression for the test animal to the gene
4 expression profile of the calorie-restricted reference animal; and
5 identifying said intervention as one that mimics the effects of calorie
6 restriction if the gene expression profile of the test animal is statistically similar to the gene
7 expression profile of the calorie restricted animal.

1 26. The method of Claim 28, wherein the gene expression profile of the
2 test animal is determined to be statistically similar to the gene expression of the calorie
3 restricted animal by one way ANOVA followed by Fisher's test ($P<0.05$).

1 27. A system for identifying an intervention that mimics the effects of
2 calorie restriction in a test animal comprising a test animal and a gene chip comprising genes
3 known to have altered expression during calorie restriction.

1 28. The system of claim 27, wherein the gene chip comprises genes
2 selected from the group consisting of genes for immune system activation, genes for DNA
3 repair, genes associated with apoptosis and genes for the enteric nervous system.